Adsorption Equilibrium of Methane on Various Adsorbents

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Natural gas has been great attention for alternative energy due to its low cost and relatively clean burning fuel compared with conventional gasoline. Although methane has a high H/C ratio and Research Octane No (RON), it requires costly high compression to use for energy source. Therefore adsorbed natural gas (ANG) used porous adsorbents have been good candidate as an interesting alternative. In this work, adsorption equilibrium isotherm of methane on various sorbents such as activated carbon, activated carbon fibers and zeolites was examined. A static volumetric method was used to measure the adsorption equilibrium amount. The equilibrium data of methane were obtained at three different temperatures (303.15, 313.15 and 323.15 K) with pressure up to 30 atm. the well−known adsorption isotherm equations including Langmuir, Sips, Toth and DA were used to correlate the collected experimental data. In addition, isosteric enthalphy of adsorption was calculated by the Clausius−Clapeyron equation.